

REMARKS

In paragraph 4 of the Office Action, the Examiner rejected Claims 1-8 under 35 U.S.C. §103 as being unpatentable over Goupy et al., U.S. Pat. No. 4,029,350 (hereinafter "Goupy et al.") in view of Carroll, III et al, U.S. Pat. No. 6,247,745 (hereinafter "Carroll, III et al").

Reconsideration is requested.

Claim 1 has been amended to recite that the deformation containment element is located on the tapered end of a longitudinal end of the honeycomb. The subject matter of claims 3 and 4 has been added to Claims 1 and Claims 3 and 4 have been cancelled. Additional amendments have been made to correct the dependency of the remaining claims.

Goupy et al. discloses an energy absorbing device having at least two absorbing members (2), each one having a honeycomb structure. A U-shaped transverse beam (1) is supported by said at least two absorbing members and said beam (1) is inserted into a shield (3) (see figures 1 and 2; and col. 1, lines 53-55). Moreover, said absorbing elements are composed of plastic materials and elastomers. The chosen materials have a slight variation of the traction elasticity modulus with respect to the temperature thereby obtaining an absorbing element having a correspondingly slight variation of apparent compression modulus (see col. 3, lines 10-20).

In contrast, the present invention teaches an improved absorption device comprising a honeycomb structure that has a further deformation containment element (15) on the tapered longitudinal end of a honeycomb structure (20), wherein the deformation containment element (15) is preferably made of a high resistance material, such as steel

(see specification page 7, lines 2-6, and lines 23-24). These containment elements must be sized in order to withstand the considerable stress due both to the impact and consequent lateral thrust of the injection-molded honeycombs (see specification page 7, lines 9-14). The effect of these elements on the overall weight of the device is modest as their volume is well below the overall volume. Said elements are disposed on top of the honeycomb structure and may be affixed (e.g., glued or welded) on top of said honeycomb structure (see figure 4, and specification page 7, lines 2-6).

In the Goupy et al. patent the material for the honeycomb structure is chosen on the basis of the variation of the traction elasticity modulus with respect to the temperature to obtain an absorbing structure having a correspondingly slight variation of the apparent compression modulus (see col. 3, lines 10-20).

The present invention teaches a material characterized by a high elongation at break value. Said characteristic permits production of injection-molded honeycombs that work more efficiently than the known injection-molded honeycombs. In fact, during the impact, the internal walls of the honeycombs molded with a polycarbonate resin do not collapse, and therefore perform very efficiently in absorbing the impact energy. Wherein said impact energy is then transformed into deformation energy (see specification page 6, lines 10-17). Additionally, the polycarbonate material is not cited in the Goupy et al. patent (see col. 3, lines 10-20).

Furthermore, neither Goupy et al. nor Carroll III, et al. discloses outlets terminating in holes (13) (see specification page 5, lines 17-20). Based on the lack of a

disclosure in the cited prior art (as well as the accompanying Figures to the prior art) there is no disclosure or suggestion of honeycomb like sections ending in holes.

Additionally, the Examiner stated that element (4) in Goupy et al. discloses a deformation containment element (4) positioned around a longitudinal end of a honeycomb. Applicant believes that the Examiner is referring to element (1), the U-shaped beam because element (4) is a peak on the graph of Fig. 6. If this is incorrect clarification is requested. Applicant respectfully disagrees with the Examiner's interpretation of the disclosure in Goupy et al. The element, as described in the Goupy et al. patent is not a containment element designed to withstand the stress of an impact and the resulting lateral thrust that is generated by the honeycomb structures when they are impacted by a force (see specification page 7, lines 9-14, and amended claim 1). Furthermore, Goupy et al. does not teach a deformation containment element as defined by the present application. The elements in Goupy et al. are noted in the prior art section of the present application and do not anticipate the present invention (specification page 1, line 18 to page 3 line 7), because the claims of the present application, as amended, point out that the deformation containment element (15) extends completely around the tapered end of the honeycomb (as shown in Fig. 4). Moreover, the Goupy et al. design does not control any expansion of the honeycomb core if an impact is applied to the U-shaped beam (1). Goupy et al. discloses a honey comb, a beam and a shield, in contrast the present invention discloses a honeycomb, a deformation containment element, which could then be combined with a beam and a shield, but neither element is a replacement for

the deformation containment element (15) as defined in the present invention.


Furthermore, Carroll III, et al. does not disclose or suggest the deformation containment element (15), holes (13) or location of the deformation containment element (15) on the taped longitudinal end of the honeycomb structure as defined in the present application and amended claim 1.

It is therefore requested that the \$103 rejection be withdrawn.

Based upon the above amendments and remarks, applicant respectfully submits that all of Claims 1-2 and 5-8 are now allowable over the prior art and that the present application is in proper form for allowance.

An early and favorable action is earnestly solicited.

Respectfully submitted,



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